

## Efficacy of diquat treatments on Brazilian waterweed, effects on native macrophytes and water quality: A case study

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Brazilian waterweed (*Egeria densa* Planch) is an invasive aquatic plant that has spread to 27 countries and 39 states in the United States. Movement has been facilitated by its popularity as an aquarium plant. Once established, the plant can adversely alter ecosystems. Brazilian waterweed spreads solely by fragmentation, which suggests that it may be easier to control than plants with propagules such as seeds, tubers, and turions. Herbicides have the potential to offer targeted control; however, their use on Brazilian waterweed has yielded mixed results, and collateral damage to desirable native species is a concern. Fence Rock Lake is a 7-ha manmade impoundment in Guilford, CT, USA. Brazilian waterweed was first documented in small patches in 2009. By 2014, the plant covered most of the littoral zone, and diquat was applied by bottom injection at a rate of  $1.8 \text{ kg ha}^{-1}$ . Control of Brazilian waterweed and effects on native species were assessed by the point intercept method. One year after treatment, in 2015, Brazilian waterweed was absent from all points except one. Another diquat treatment was performed in an effort to eradicate the plant from the lake. In 2016 and 2017, no Brazilian waterweed was found. The native plant community was resilient with an increase in species richness from 11 pretreatment to 18 two years posttreatment. Combined native species showed little change in frequency of occurrence. Frequency of occurrence of individual native species exhibited losses, gains, or little change depending on species. Bottom injected diquat concentrations remained low near the bottom and highest near the surface. No diquat was detected 10 days after treatment. Littoral zone dissolved oxygen fell to near, but not below, levels considered harmful to warm water fish. Transparency and total phosphorus were not substantially affected by the diquat treatment. This study confirms that Brazilian waterweed is highly controllable in a Connecticut lake with two successive yearly diquat treatments.